APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/765,916	01/18/2001	Frederic Canut	260/087	8270

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EXAMINER
KANG, INSUN

ART UNIT	PAPER NUMBER
2193	

DATE MAILED: 09/01/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 10/03)

	Application No.	Applicant(s)
Office Action Summary	09/765,916	CANUT ET AL.
	Examiner	Art Unit	
	Insun Kang	2193	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE _3_ MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
  Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on _08 June 2006_.

2a)☒ This action is **FINAL**.　　　　2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) _1-26_ is/are pending in the application.

　　4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) _1-26_ is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

　　Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

　　Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

　　a)☐ All　b)☐ Some * c)☐ None of:

　　　1.☐ Certified copies of the priority documents have been received.

　　　2.☐ Certified copies of the priority documents have been received in Application No. _____.

　　　3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

　　* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
　　Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413)
　　Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

1.   This action is in response to the amendment filed 6/8/2006.

2.   As per applicant's request, claims 1 and 14 have been amended. Claims 1-26 are pending

in the application.

Claim Rejections - 35 USC § 103

3.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set
> forth in section 102 of this title, if the differences between the subject matter sought to be patented and
> the prior art are such that the subject matter as a whole would have been obvious at the time the
> invention was made to a person having ordinary skill in the art to which said subject matter pertains.
> Patentability shall not be negatived by the manner in which the invention was made.

4.   Claims 1-3, 8-16 and 21-26 are rejected under 35 U.S.C. 103(a) as being unpatentable

over Pieper et al (US 2003/0005419) in view of Cain et al ("Portable Software Library

Optimization," 2/1998) hereinafter referred to as "Cain."

Regarding claim 1:

Pieper et al. disclose: a method of optimizing a software program for a target processor to meet

performance objectives, where the software program is coded in a high-level Language (par.

0019; par. 0020), the method comprising the steps of: (a) optimizing the software program such

that a resulting first optimized form of the software program is at least partially independent of

the target processor and is at least partially coded in the high-level language, determining a first

performance profile for the first optimized form of the software program, and comparing the first

performance profile with the performance objectives (par. 0020; 0030); (b) based on the results

of comparing the first performance profile with the performance objectives, if the performance

objectives are not met by the first optimized form of the software program, then optimizing the

first optimized form of the software program such that a resulting second optimized form of the

software program includes at least one portion that is dependent on the target processor and is

coded in the high-level language (par. 0031, 0020; par. 0045);

Pieper et al. do not explicitly disclose flagging at least one portion to indicate that the at

least one portion is dependent on the target processor if the first optimized form of the software

program is optimized to create the second optimized form of the software program. However,

Cain teaches that using flags was known in the art of software development and optimization, at

the time applicant's invention was made, to mark or identify some portions or whole code as an

event of some type or having a special purpose or capability ("#include directive is used to

retrieve the desired system-specific API," page 7). It would have been obvious for one having

ordinary skill in the art of computer software development and optimization to modify Pieper's

disclosed system to flag the modified target dependent code. The modification would be obvious

because one having ordinary skill in the art would be motivated to identify the target specific

code for efficient optimization and portability (page 6-7) as taught by Cain.

Regarding claim 2:

The rejection of claim 1 is incorporated, and further, Pieper et al. disclose: (bl) determining a

second performance profile for the second optimized form of the software program, and

comparing the second performance profile with the performance objectives (par. 0032; 0044) as

claimed.

Regarding claim 3:

The rejection of claim 2 is incorporated, and further, Pieper et al. disclose:

-optimizing the second optimized form of the software program such that a resulting third

optimized form of the software program is at least partially dependent on the target processor

and includes portions coded in a low-level language of the target processor (par. 0031) as

claimed.

Regarding claim 9:

Pieper et al. further disclose the act of implementing reference code comprises code profiling

(par. 0031, 0042 ; 0046 ; 0048 ; 0049 ; 0052) as claimed.

Regarding claim 8, this claim is another version of the claimed method discussed in claim 9,

wherein all claim limitations also have been addressed and/or covered in cited areas as set forth

the above.

Regarding claim 10:

The rejection of claim 1 is incorporated, and further, Pieper et al. disclose :

-the act of optimization predicted to improve resulting assembly code ("In generating the code,

generator modifies the code such that code reflects scheduling and other low-level optimizations

of the code, which are dependent on the target processor architecture," 0031; 0032; 0009).

Regarding claim 11:

The rejection of claim 1 is incorporated, and further, Pieper et al. disclose the act of tuning

low-level functions (0031) as claimed.

Regarding claim 12:

The rejection of claim 1 is incorporated, and further, Pieper et al. disclose the act of manual

assembly optimization. Hand-coded assembly for optimized performance is necessary for

performance critical routines such as graphics or math library routines as they often must access

low-level machine instructions for optimal execution performance. Therefore, accordingly,

Pieper et al. anticipate this claim. See also 0009 and 0018.

Regarding claim 13:

The rejection of claim 1 is incorporated, and further, Pieper et al. the act of feature tuning (0031;

0032).

Per claims 14-16 and 21-26, they are the computer-readable medium versions of claims

1-3 and 8-13, respectively, and are rejected for the same reasons set forth in connection with the

rejection of claims 1-3 and 8-13 above.

Claim Rejections - 35 USC § 103

5.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set
> forth in section 102 of this title, if the differences between the subject matter sought to be patented and
> the prior art are such that the subject matter as a whole would have been obvious at the time the
> invention was made to a person having ordinary skill in the art to which said subject matter pertains.
> Patentability shall not be negatived by the manner in which the invention was made.

6.   Claims 4-7 and 17-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over

Pieper et al (US 2003/0005419) in view of Cain et al ("Portable Software Library Optimization,"

2/1998) hereinafter referred to as "Cain" and further in view of Kum et al. (0-7803-5041-3/99,

IEEE).

Regarding claim 4:

The rejection of claim 1 is incorporated, and further, Pieper et al. and Cain do not explicitly teach a floating-point implementation. However, Kum et al. disclose deriving a floating point implementation (pg 2163, introduction, par. 3, "the ranges of floating point variables are estimated by the simulation of the range estimation program that is automatically generated from the original floating-point version," see also Figure 1) for the purpose of automatic scaling of all numbers so that the numbers use the full word length available and for the purpose of reducing the risk of overflow. Therefore, it would have been obvious to a person of ordinary skill in the art to incorporate the teachings of Kum et al. to the system of Pieper et al and Cain. The modification would be obvious to include the floating-point implementation because of the automatic scaling of each number to use the full word length of the mantissa so that accurate representation of numbers can be obtained while minimizing the risk of overflow and quantization errors (pg 2163, introduction, par. 3).

Regarding claim 5:

The rejection of claim 1 is incorporated, and further, Pieper et al. andCain do not explicitly teach a fixed point implementation. However, Kum et al. disclose the method of claim 1 in which step (a) comprises the act of deriving a fixed point implementation so that "assembly coding and manual scaling can be avoided and the translated C programs are executed very efficiently" in fixed-point DSPs (pg 2163, introduction, lines 1-15). Therefore, it would have been obvious to a person of ordinary skill in the art to incorporate the teachings of Kum et al. to the system of Pieper et al and Cain. The modification would be obvious to include the fixed-point implementation so that round-off errors can be prevented and target dependent scaling shift can

be minimized while obtaining fast real-time processing with less power and memory usage (pg 2163, introduction, lines 1-15).

Regarding claim 6:

The rejection of claim 5 is incorporated, and further, Pieper et al. and Cain do not explicitly teach the act of processing qualification. However, Kum et al. further disclose the act of processing qualification (Introduction, par.3; simulation-based integer word-length determination, pg 2165, shift reduction, par. 10; pg 2163, par. 6; pg 2166, Concluding remarks) so that cost effective and high quality fast real-time processing with less power and memory usage can be obtained while reducing quantization noise (Introduction, par.3; simulation-based integer word-length determination, pg 2165, shift reduction, par. 10; pg 2163, par. 6; pg 2166, Concluding remarks). Therefore, it would have been obvious to a person of ordinary skill in the art to incorporate the teachings of Kum et al. to the system of Pieper et al and Cain. The modification would be obvious to include the act of processing qualification for the purpose of high quality processing with minimized quantization noise.

Regarding claim 7:

The rejection of claim 5 is incorporated, and further,, Pieper et al. and Cain do not explicitly teach the act of implementation sizing. However, Kum et al. further disclose the act of implementation sizing (abstract; Introduction, pg 2163, par.3; pg 2163, simulation-based integer word-length determination) by program-profiling results (pg 2164-2165, Sift reduction) so that estimation of code size for the target can be obtained and the risk of overflow can be prevented. Therefore, it would have been obvious to a person having ordinary skill in the art to incorporate the teachings of Kum et al. to the system of Pieper et al and Cain. The modification would be

obvious to include the act of implementation sizing for the purpose of code size estimation so

that the risk of overflow can be prevented (pg 2164-2165, Sift reduction).

Per claims 17-20, they are the computer-readable medium versions of claims 4-7,

respectively, and are rejected for the same reasons set forth in connection with the rejection of

claims 4-7 above.

Response to Arguments

7.   Applicant's arguments filed 6/8/2006 have been fully considered but they are not

persuasive.

Per claims 1 and 14:

The applicant states that support for "a resulting first optimized form of the software program is

completely independent of the target processor and is at least partially coded in the high-level

language" is supported throughout the Applicant's specification, for example, in page 6, line 4 to

page 7, line 18 (page 6-7)" and Pieper specifically discloses that a portion or part of the

optimized code is not independent (page 6).

In response, the applicant have changed the phrase "at least partially independent" to

"completely independent" with attempt to overcome Pieper. The original phrase was

"substantially." The word "completely independent" does not appear anywhere throughout the

specification. In fact, "substantially independent" is recited (i.e. page 2). In page 6 of the instant

specification, the only phrase that can be related to "completely independent" is "target-

independent optimization" in line 14. If the "target-independent optimization" of a high-level

language is what "completely independent" means, it is unclear what the statement, "first

optimizing the software program in the high-level language, using optimizations that are

substantially independent of the target processor to host the application (page 2)" indicates?

The instant specification also states: "In a first optimization step…, the software…is written in a

high-level language such as C, C++ …completely portable between all probable DSP targets …

if by completing the step 102 of target-independent optimization of the performance objectives

are achieved, then the overall optimization process 100 successfully terminates 112 (page 6)."

Therefore, it appears that the applicant is attempting to change the scope by changing words

from "substantially" and "at least partially" to "completely independent" in connection to

"target-independent." Therefore, "completely independent of the target processor" is interpreted

as "target-independent." Pieper indeed states that a first set of computer program instructions in

a relatively higher level program instruction language is converted by compilation processes

(0018, page 2) where the relatively higher level program language can be C++ (0009, page 1)

and the code output by the optimization processes is in an intermediate level program code

language that is **substantially independent** of the architecture of the target processor (0030,

page 3), however, Pieper also specifically states that during the compilation process, "the

prefetch instructions may be explicitly inserted into an intermediate level, **machine-independent**

code that is first generated by the process from the input source code (par 0020, page 3).

Therefore, this statement teaches "completely independent of the target processor" recited in the

instant claims 1 and 14. Accordingly, Pieper teaches the limitations in claims 1 and 14. If

applicant means anything more, this (with support of the specification) must be brought out in

the claims to further clarify the invention.

Note: the rejection under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement will not be given at this time as the limitation "completely independent" can be reasonably interpreted as "target-independent" as shown above. If "completely independent" means more than "target-independent," the applicant is requested to provide the cited portion(s) in the specification and explanation.

Per claims 2-13 and 15-26:

The applicant states that claims 2-13 and 15-26 are allowable as being dependent on the allowable base claims. As shown above, the rejections of the independent claims 1 and 14 by Pieper are maintained, the argument that claims 2-13 and 15-26 are allowable as being dependent on the allowable base claims is moot. Accordingly, the rejections of claims 2-13 and 15-26 are maintained.

Conclusion

8.   **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event,

however, will the statutory period for reply expire later than SIX MONTHS from the mailing

date of this final action.

9.   Any inquiry concerning this communication or earlier communications from the

examiner should be directed to Insun Kang whose telephone number is 571-272-3724. The

examiner can normally be reached on M-TR: 6:30-5:00 PM.

        If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, Kakali Chaki can be reached on 571-272-3719. The fax phone number for the

organization where this application or proceeding is assigned is 703-872-9306.

        Information regarding the status of an application may be obtained from the Patent

Application Information Retrieval (PAIR) system. Status information for published applications

may be obtained from either Private PAIR or Public PAIR. Status information for unpublished

applications is available through Private PAIR only. For more information about the PAIR

system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR

system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

        Any inquiry of a general nature or relating to the status of this application should be

directed to the TC 2100 Group receptionist: 571-272-2100.

I. Kang
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